Time: 3 hours   **SUBJECT – MATH (IIT-JEE)**   **Marks: 50**

(Straight line)

NAME OF STUDENT:-_____   DATE:- …./…../……….

❖ INSTRUCTION:- ATTEMT ALL QUESTION.

Q1. The x-coordinate of the incentre of the triangle that has the coordinates of mid-points of its sides as (0,1),(1,1) and (1,0) is.

(a) $2 + \sqrt{2}$ (b) $2 - \sqrt{2}$ (c) $1 + \sqrt{2}$ (d) $1 - \sqrt{2}$

Q2. Let O(0,0), P(3,4) and Q(6,0) be the vertices of a ΔOPQ. the point R inside the ΔOPQ is such that the triangles OPR, PQR, and OQR are of equal area. The coordinates of R are.

(a) $\left(\frac{4}{3},\ 3\right)$ (b) $\left(3,\ \frac{2}{3}\right)$ (c) $\left(3,\ \frac{4}{3}\right)$ (d) $\left(\frac{4}{3},\ \frac{2}{3}\right)$

Q3. The incentre of the triangle with vertices (1, $\sqrt{3}$), (0,0) and (2,0) is

(a) $\left(1,\ \frac{\sqrt{3}}{2}\right)$ (b) $\left(\frac{2}{3},\frac{1}{\sqrt{3}}\right)$ (c) $\left(\frac{2}{3},\frac{\sqrt{3}}{2}\right)$ (d) $\left(1,\ \frac{1}{\sqrt{3}}\right)$

Q4. Suppose that the points (h,k) , (1,2) and (-3,4) lie on the line L_1. If a line L_2 passing through the point (h,k) and (4,3) is perpendicular to L_1, then $\frac{k}{h}$ equals.

(a) $\frac{-1}{7}$ (b) $\frac{1}{3}$ (c) 3   (d) 0

Q5. If the straight line $2x - 3y + 17 = 0$ is perpendicular to the line passing through the points (7,17) and (15,β) then β equals

(a) $\frac{35}{3}$ **(b)** $- 5$ **(c)** $\frac{-35}{3}$ **(d) 5**

Q6. A triangle has a vertex at (1,2) and the mid-points of the two sides through it are (-1,1) and (2,3). Then the centroid of this triangle is.

(a) $\left(1 , \frac{7}{3} \right)$ **(b)** $\left(\frac{1}{3}, 2 \right)$ **(c)** $\left(\frac{1}{3}, 1 \right)$ **(d)** $\left(\frac{1}{3}, \frac{5}{3} \right)$

Q7. A point P moves on the line $2x - 3y + 4 = 0$. If Q(1,4) and R(3,-2) are fixed points, then the locus of the centroid of ΔPQR is a line

(a) With slope $\frac{2}{3}$ **(b)** With slope $\frac{3}{2}$

(c) parallel to $y - axis$ **(d)** parallel to $x - axis$

Q8. The set of all possible values of θ in the interval (0, λ) for which the points (1,2) and $(sin\theta, cos\theta)$ lie on the same side of the line $x + y = 1$ is.

(a) $\left(0 , \frac{\lambda}{2} \right)$ **(b)** $\left(\frac{\lambda}{4}, \frac{3\lambda}{4} \right)$ **(c)** $\left(0, \frac{3\lambda}{4} \right)$ **(d)** $\left(0, \frac{\lambda}{4} \right)$

Q9. Slope of a line passing through P (2,3) and intersecting the line $x + y = 7$ at a distance of 4 units from P is.

(a) $\frac{1-\sqrt{5}}{1+\sqrt{5}}$ **(b)** $\frac{\sqrt{7}-1}{\sqrt{7}+1}$ **(c)** $\frac{1-\sqrt{7}}{1+\sqrt{7}}$ **(d)** $\frac{\sqrt{5}-1}{\sqrt{5}+1}$

Q10. If in a parallelogram ABCD the coordinate of A,B and C are respectively (1,2), (3,4) and (2,5) then the equation of the diagonal AD is

(a) $3x + 5y - 13 = 0$ **(b)** $3x - 5y + 7 = 0$

(c) $5x - 3y + 1 = 0$ **(d)** $5x + 3y - 11 = 0$

Q11. If PS is the median of the triangle with vertices P(2,2) Q(6,-1) and R(7,3) then equation of the line passing through (1,-1) and parallel to PS is

(a) $4x - 7y - 11 = 0$ **(b)** $2x + 9y + 7 = 0$

(c) $4x + 7y + 3 = 0$ **(d)** $2x - 9y - 11 = 0$

Q12. **If a straight line passing through the point P(-3,4) is such that its intercepted portion between the coordinate $axis$ is bisected at P, then its equation is**

(a) $x - y + 7 = 0$ **(b)** $4x - 3y + 24 = 0$

(c) $8x - 4y + 25 = 0$ **(d)** $4x + 3y = 0$